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10/733,224	12/11/2003	In-Kuk Yun	5000-1-486	8012

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EXAMINER	
CURS, NATHAN M	

ART UNIT	PAPER NUMBER
2613	

DATE MAILED: 10/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/733,224	YUN ET AL.	
	Examiner	Art Unit	
	Nathan Curs	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 December 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10/04,5/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. Figures 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 8 and 20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Specifically, separating of the optical signal from the traveling path by refraction is not described in the specification.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 5, 10 and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 5, 10 and 17, the claimed limitations "second collimating lens system", "second convergence lens system" and "second glass window", without any corresponding claimed "first" limitations, make the bounds of the claims ambiguous.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-7 and 9-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art ("APA") (specification figs. 1 and 2 and page 1, line 13 to page 5, line 11) in view of Tiemeijer et al. ("Tiemeijer") ("High-gain 1310 nm semiconductor optical amplifier modules with a built-in amplified signal monitor for optical gain control"; Tiemeijer et al.; Photonics Technology Letters, IEEE; Volume 9, Issue 3, March 1997; pages: 309-311).

Regarding claim 1, APA discloses a semiconductor optical amplifier (SOA) module apparatus for amplifying an optical signal received from an input optical fiber, and transmitting the amplified optical signal to an output optical fiber, comprising: a semiconductor optical amplifier (SOA) for amplifying an optical signal applied to its own first stage (fig. 1 and page 2, lines 17-20, where the SOA inherently outputs an ASE light at the first stage); outputting the

amplified optical signal at its own second stage (fig. 2 and page 2, lines 17-20); an input unit having a first isolator which transmits an input optical signal to the first stage of the SOA (fig. 1, element 143 and page 3, lines 3-17); a first monitor photo-diode for receiving, and detecting a power level of, a portion of the signal light (fig. 1, element 162 and page 3, line 20 to page 4, line 4); and an output unit for converging the amplified optical signal received from the SOA onto one end of the output optical fiber (fig. 2 and page 2, lines 17-20). APA discloses that the monitored signal is used for maintaining proper amplification and is based on reflecting part of the main signal at an angle away from the main signal propagation, toward the monitoring photodiode, but does not disclose that the first isolator controls the ASE light received from the first stage of the SOA to separate it from a traveling path of the input optical signal at a prescribed angle, and transmits the ASE light separated from the traveling path, or that the first monitor photo-diode detects a power level of the ASE light passing through the first isolator. Tiemeijer discloses an SOA amplifier where monitoring is used on both sides of the SOA to maintain proper amplification, and where ASE light is isolated from the traveling path using light reflections off the lenses that couple light into and out of the SOA and the ASE light is monitored and used in controlling the amplification of the SOA (fig. 1 and pages 309-311). It would have been obvious to one of ordinary skill in the art at the time of the invention to control amplification in APA by monitoring ASE in angled reflections off the collimating lenses of APA, instead of monitoring portions of the main signal light reflectively removed from the main traveling path, to provide the benefit of not causing signal loss due to tapping of the main signal, as taught by Tiemeijer (page 309, section "Introduction").

Regarding claim 2, the combination of APA and Tiemeijer discloses the apparatus as set forth in claim 1, wherein the input unit includes: a first collimating lens system for facing one end of the input optical fiber, and collimating the optical signal (APA: fig. 1, element 144); a first

glass window for transmitting to the first isolator the optical signal collimated at the first collimating lens system (APA: fig. 1, element 142); and a first convergence lens system, disposed between the first isolator and the first stage of the SOA, for converging the optical signal received from the first isolator onto the first stage of the SOA, and outputting to the first isolator the ASE light emitted from the first stage of the SOA (APA: fig. 1 elements 143 and 144 and Tiemeijer: fig. 1, as applicable in the combination).

Regarding claim 3, the combination of APA and Tiemeijer discloses the apparatus as set forth in claim 1, further including a controller communicatively connected with the first photo diode and configured for determining a power level of the optical signal as a function of the detected power level of the ASE light (APA: fig. 1, elements 162 and 180 and Tiemeijer: fig. 1, as applicable in the combination).

Regarding claim 4, the combination of APA and Tiemeijer discloses the apparatus as set forth in claim 1, further comprising: a second monitor photo-diode for detecting an uncoupled optical signal which is emitted from the output unit without being transmitted to the one end of the output optical fiber (APA: fig. 2, element 171 and Tiemeijer: fig. 1, as applicable in the combination).

Regarding claim 5, the combination of APA and Tiemeijer discloses the apparatus as set forth in claim 1, wherein the output unit includes: a second collimating lens system for collimating the amplified optical signal received from the second stage of the SOA (APA: fig. 2, element 154); a second isolator for transmitting the amplified optical signal received from the second collimating lens system, controlling a partially-uncoupled optical signal to separate it from a traveling path of the amplified optical signal at a prescribed angle, and transmitting the uncoupled optical signal separated from the traveling path (APA: fig. 2, elements 153 and 154 and Tiemeijer: fig. 1, as applicable in the combination); a second convergence lens system

disposed for converging the amplified optical signal received from the second isolator onto one end of the output optical fiber (APA: fig. 2, element 151); and disposed between the second isolator and the second convergence lens system, a second glass window for transmitting the collimated amplified optical signal to the second convergence lens system (APA: fig. 2, element 152).

Regarding claim 6, the combination of APA and Tiemeijer discloses the apparatus as set forth in claim 5, further comprising a second monitor photo-diode for receiving and detecting a power level of the separated partially-uncoupled optical signal (APA: fig. 2, element 171 and Tiemeijer: fig. 1, as applicable in the combination).

Regarding claim 7, the combination of APA and Tiemeijer discloses the apparatus as set forth in claim 6, further including a controller communicatively connected with the second monitor photo-diode and configured for determining a power level of the amplified optical signal received from the second stage based on the detected power level of the separated partially-coupled optical signal (APA: fig. 2, elements 171 and 180 and Tiemeijer: fig. 1, as applicable in the combination).

Regarding claim 9, the combination of APA and Tiemeijer discloses the apparatus as set forth in claim 7, wherein the controller is configured for determining, as a function of the detected power level of the ASE light, a power level of the optical signal before amplification by the SOA (APA: page 4, line 17 to page 5, line 1 and Tiemeijer: pages 309 and 310 and as applicable in the combination).

Regarding claim 10, the combination of APA and Tiemeijer discloses the apparatus as set forth in claim 1, wherein the output unit includes: a second collimating lens system for collimating the amplified optical signal received from the second stage of the SOA (APA: fig. 2, element 154); a second convergence lens system for converging the amplified optical signal

collimated by the second collimating lens system onto one end of the output optical fiber (APA: fig. 2, element 151); disposed between the second collimating lens system and the second convergence lens system, a second isolator for transmitting the amplified optical signal received from the second collimating lens system to the second convergence lens system, and cutting off optical signals received from the second convergence lens system (APA: fig. 2, element 153); and a second glass window disposed between the second isolator and the second convergence lens system, for transmitting the amplified optical signal received from the second isolator to the second convergence lens system (APA: fig. 2, element 152). The combination as described for claim 1 does not disclose a second window reflecting a partially-uncoupled optical signal to separate it from the traveling path of the amplified optical signal at a prescribed angle. However, based on the basic lens reflection teaching of Tiemeijer fig. 1 for the monitoring signal at the output side, it would have been obvious to one of ordinary skill in the art at the time of the invention to use any reflective surface in the traveling path to reflect the monitoring signal away from the traveling path in order to provide the monitoring signal to the photodiode.

Regarding claim 11, the combination of APA and Tiemeijer discloses the apparatus as set forth in claim 10, further comprising a second monitor photo-diode for receiving and detecting a power level of the reflected partially-uncoupled optical signal (APA: fig. 2, element 171 and Tiemeijer: fig. 1, as applicable in the combination).

Regarding claim 12, the combination of APA and Tiemeijer discloses the apparatus as set forth in claim 11, further including a controller communicatively connected with the second monitor photo-diode and configured for determining a power level of the amplified optical signal received from the second stage based on the detected power level of the reflected partially-uncoupled optical signal (APA: fig. 2, elements 171 and 180 and Tiemeijer: fig. 1, as applicable in the combination).

Regarding claim 13, the combination of APA and Tiemeijer discloses the apparatus as set forth in claim 12, wherein the controller is configured for determining, as a function of the detected power level of the ASE light, a power level of the optical signal before amplification by the SOA (APA: page 4, line 17 to page 5, line 1 and Tiemeijer: pages 309 and 310 and as applicable in the combination).

Regarding claim 14, APA discloses a semiconductor optical amplifier (SOA) module apparatus for amplifying an optical signal received from an input optical fiber, and transmitting the amplified optical signal to an output optical fiber, comprising: a semiconductor optical amplifier (SOA) having a first stage and a second stage, the SOA for amplifying an optical signal applied to the first stage, outputting the amplified optical signal at the second stage (fig. 1 and page 2, lines 17-20, where the SOA inherently outputs an ASE light at the first stage); an input unit which transmits an input optical signal to the first stage of the SOA (fig. 1, element 143 and page 3, lines 3-17); a first monitor photo-diode for receiving, and detecting a power level of, a portion of the signal light (fig. 1, element 162 and page 3, line 20 to page 4, line 4); an output unit for converging the amplified optical signal received from the SOA onto one end of the output optical fiber (fig. 2 and page 2, lines 17-20); and a controller in communicative connection with the first monitor photo-diode, the output unit and the SOA and configured for regulating a level of amplification of the SOA (fig. 1, element 180 and page 4, line 17 to page 5, line 1). APA discloses that the monitored signal is used for maintaining proper amplification and is based on reflecting part of the main signal at an angle away from the main signal propagation, toward the monitoring photodiode, but does not disclose that the first isolator controls the ASE light received from the first stage of the SOA to separate it from a traveling path of the input optical signal at a prescribed angle, and transmits the ASE light separated from the traveling path, or that the first monitor photo-diode detects a power level of the ASE light passing through

the first isolator. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine Tiemeijer with APA, as described above for claim 1.

Regarding claim 15, the combination of APA and Tiemeijer discloses the apparatus as set forth in claim 14, wherein the controller is configured for determining a power level of the optical signal as a function of the detected power level of the ASE light (APA: page 4, line 17 to page 5, line 1 and Tiemeijer: pages 309 and 310 and as applicable in the combination).

Regarding claim 16, the combination of APA and Tiemeijer discloses the apparatus as set forth in claim 14, further comprising: a second monitor photo-diode for detecting an uncoupled optical signal which is emitted from the output unit without being transmitted to the one end of the output optical fiber (APA: fig. 2, element 171 and Tiemeijer: fig. 1, as applicable in the combination).

Regarding claim 17, the combination of APA and Tiemeijer discloses the apparatus as set forth in claim 14, wherein the input unit includes a first isolator for transmitting the input optical signal to the first stage (APA: fig. 1, element 143) and wherein the output unit includes: a second collimating lens system for collimating the amplified optical signal received from the second stage of the SOA (APA: fig. 2, element 154); a second isolator for transmitting the amplified optical signal received from the second collimating lens system, controlling a partially-uncoupled optical signal to separate it from a traveling path of the amplified optical signal at a prescribed angle, and transmitting the uncoupled optical signal separated from the traveling path (APA: fig. 2, elements 153 and 154 and Tiemeijer: fig. 1, as applicable in the combination); a second convergence lens system disposed for converging the amplified optical signal received from the second isolator onto one end of the output optical fiber (APA: fig. 2, element 151); and disposed between the second isolator and the second convergence lens system, a

second glass window for transmitting the collimated amplified optical signal to the second convergence lens system (APA: fig. 2, element 152).

Regarding claim 18, the combination of APA and Tiemeijer discloses the apparatus as set forth in claim 17, further comprising a second monitor photo-diode for receiving and detecting a power level of the separated partially-uncoupled optical signal (APA: fig. 2, element 171 and Tiemeijer: fig. 1, as applicable in the combination).

Regarding claim 19, the combination of APA and Tiemeijer discloses the apparatus as set forth in claim 18, wherein the controller is configured for determining a power level of the amplified optical signal received from the second stage based on the detected power level of the separated partially-coupled optical signal (APA: page 4, line 17 to page 5, line 1 and Tiemeijer: pages 309 and 310 and as applicable in the combination).

Conclusion

8. Any inquiry concerning this communication from the examiner should be directed to N. Curs whose telephone number is (571) 272-3028. The examiner can normally be reached on M-F (from 9 AM to 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached at (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (800) 786-9199.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR system, see http://pairdirect.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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